



Integrated Solutions for a Sustainable Flagstaff

Promoting Economic Vitality, Energy Independence and Social Inclusion in the Flagstaff Community

EXECUTIVE SUMMARY

The reinvestment in our nation's economy is underway and Arizona, with vast solar and wind resources is poised to be a major contributor on the front lines of a transition to energy independence. The City of Flagstaff has developed a concept in close collaboration with Coconino County Energy Conservation and Workforce Development Program, which will establish the City as a leader in integrated solutions in energy conservation and workforce stabilization and development. The City of Flagstaff's **Integrated Solutions for a Sustainable Flagstaff (ISSF)** is a comprehensive strategy that addresses the three tenets of a sustainable community by promoting energy independence, increasing economic vitality and facilitating social inclusion.

Proposed programming will serve to sustain and create jobs while stimulating business through the implementation of measures to reduce community wide energy and water consumption, and greenhouse gas emissions.

It is currently possible to cost-effectively reduce energy and water use in existing residential structures by 30% using readily available technologies, building practices, standards and skills. Due to the current global economic climate and regional economic conditions, Flagstaff residents often lack fiscal resources or access to affordable financing that would spur investment in energy and water efficiency improvements.

With a design mirroring that of Coconino County Energy Conservation and Workforce Development Program, proposed programming will operationalize the City of Flagstaff's sustainability, climate management and energy efficiency strategies currently underway. The program will utilize existing building science professionals, contractors, public-private partnerships and a workforce development program based on the model of the Civilian Conservation Corps to offer direct installation of energy and water conservation measures targeting the Flagstaff residential sector. Services will be available to residents according to an income based fee structure whereby American Reinvestment and Recovery Act (ARRA) funding will be leveraged against participant's contributions to subsidize the expense of implementing structural energy audits and mitigation measures for improvements. The leveraged funds will maintain a revolving fund to help support the program beyond ARRA.

As a result, Flagstaff will experience a reduction in resource consumption and greenhouse gas emissions, while generating and retaining a local green-collar workforce and returning federal investment to the local economy through job creation and reduced utility expenses.

Promoting Economic Vitality, Energy Independence, and Social Equity in the Flagstaff Community

PROGRAM GOALS

ISSF is an integrated solution for addressing resource conservation, economic development and social inclusion issues within Flagstaff. Developed in partnership with the Coconino County Energy Conservation and Workforce Development Program, ISSF will reduce energy consumption, reduce utility expenses, increase energy efficiency of existing residential buildings, stabilize current and develop new workforce, create training opportunities and generate regional economic development through increased community investment. The program will serve to train a local green collar workforce to provide energy and water conservation services to City residents. Program goals include: 550 residential energy efficiency retrofits, 8 - 12 jobs created and retained, 5 million kilowatts of energy saved annually, 3,260,000 pounds of carbon dioxide offset annually and \$195,000 saved in utility bills annually.

COMMUNITY NEEDS

Economic health

Flagstaff is the largest city in northern Arizona; with a geopolitical boundary population of 58,213 and a metropolitan area population of 124,953. Flagstaff is the economic hub of Coconino County, the second largest county in the continental United States. Known for its natural beauty, proximity to the Grand Canyon and winter snow sports, Flagstaff's economy is predominantly tourism dependent.

Flagstaff residents experience a high cost of living at 114% of the national index while subjected to below market salaries. 2005 mid-census data revealed that 17.4% of Flagstaff residents were living below the poverty level while the threshold for the state of Arizona is 14.2% and the U.S. rate is 12.4%. Flagstaff's per capita income is 45% below the national average with a current unemployment rate of 6.2%. In 2006 the average property price peaked at \$387,672, 23% higher than the average property price in 2005 and 10% higher than the average property price in 2007. The current (end of first quarter 2009) average property price is \$347,681.

Flagstaff's economic conditions often render residents without the fiscal resources or access to affordable financing required to incorporate energy efficiency improvements.

Increasing Utility Expenses

According to a 2007 Fact Sheet prepared by Fisher, Sheehan & Colton, Public Finance and General Economics of Belmont, Massachusetts,

“Home energy is a crippling financial burden for low income Arizona households. Arizona households with incomes of below 50% of the Federal Poverty Level pay 49.3% of their annual income simply for their home energy bills...Bills for households between 75% and 100% of Poverty take up 14.1% of income. Even households with incomes between 150% and 185% of the Federal Poverty Level have energy bills above the percentage of income generally considered to be affordable.”

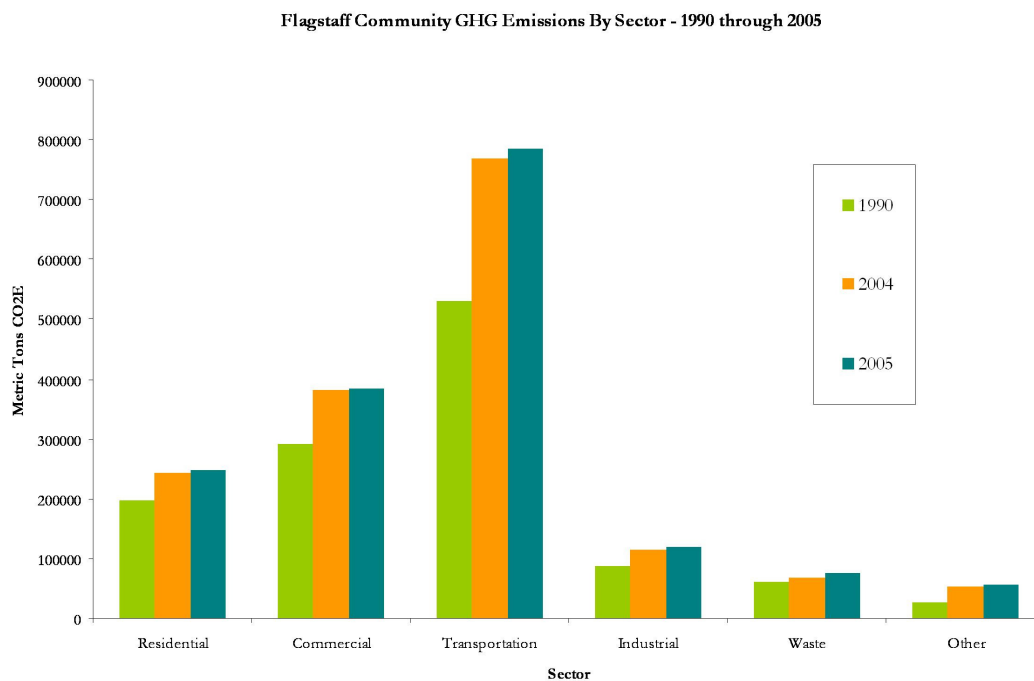
Integrated Solutions for a Sustainable Flagstaff

In Flagstaff, winter utility bills have nearly tripled over the last two years and according to the US Department of Housing this burden on the poor is one of the primary causes of homelessness. The local electricity provider, Arizona Public Service, has increased rates 25% since 2005 and is requesting an additional 10% increase in 2009. The local natural gas provider issued a 21% rate increase in 2003 and a 4% increase in 2007. Pending approval by the Arizona Corporation Commission a 6% increase in natural gas rates is expected in late 2009.

Increasing Greenhouse Gas Emissions

In support of the City of Flagstaff's commitment to the U.S. Mayors Climate Protection Agreement the City conducted a baseline assessment of greenhouse gases in August of 2008. The greenhouse gas emission inventory revealed that residential energy consumption was the third largest emitter of greenhouse gases.

The residential sector's energy consumption and greenhouse gas emissions are steadily increasing. In 2004, Flagstaff residents consumed 131,554,685 kilowatt hours of energy generating 242,043 metric tons of carbon dioxide equivalents. In 2005 this increased to 135,683,685 kilowatt hours generating 247,004 metric tons of carbon dioxide equivalents.



In 2005, the average per capita greenhouse gas emissions in the City of Flagstaff was 26.2 tons of carbon dioxide equivalents per person per year. This is above the national average of 22 tons of carbon dioxide equivalents. The residential sector is a sector that can be immediately targeted to significantly reduce greenhouse gas emissions.

Lacking Local “Green Collar” Workforces

High poverty rates, economic hardship and Flagstaff’s geographic isolation result in reduced opportunity for regional youth and young adults. Coconino County’s Career Center reports that this lack of opportunity presents a series of associated challenges. These challenges underscore the need for the development of a “green collar” workforce in Coconino County. According to Green for All, a national organization dedicated to lifting people out of poverty through the creation of a green workforce,

“There’s already a huge green economy developing. In 2006 renewable energy and energy efficiency technologies generated 8.5 million new jobs, nearly \$970 billion in revenue, and more than \$100 billion in industry profits.”

According to the National Renewable Energy Lab, “The major barriers to a more rapid adoption of renewable energy and energy efficiency in America are insufficient skills and training.” Developing and retaining a “green collar” workforce in northern Arizona is a critical need.

PROGRAM DESIGN

Overview

Utilizing existing businesses, contractors, non-profit agencies, public-private partnerships and a workforce development program based on the model of the Civilian Conservation Corps, the proposed program will offer two tiers of energy and water conservation services targeting Flagstaff residential buildings. These services will be available to residents based on an income based sliding scale fee structure whereby ARRA funding will be leveraged against participant’s contributions to subsidize the expense of implementing energy audits and mitigation measures for efficiency improvements. The leveraged funds will maintain a revolving fund to support the long term sustainability of the program beyond ARRA.

Workforce Stabilization and Development

ISSF programming will preserve and create jobs in the building science and building supply sectors. Local businesses will be encouraged to provide service products and preference will be given to American made products. This economic development and stabilization will be immediate and have direct, indirect and long term impact throughout Flagstaff.

In addition to creation of positions in both public and private sectors responsible for coordinating overall program implementation, proposed programming will create an Energy Conservation Corps (ECC), providing apprenticeship-style training and on-the-job skill development opportunities for underemployed and dislocated workers throughout Coconino County. ECC members will learn green collar trades and build connections with local businesses, agencies and governments in need of workforces in these emerging sectors.

The ECC will serve multiple participants annually providing energy retrofit training and skill-building in residential energy efficiency processes alongside certified building science and renewable energy professionals. Training and experiences will include home energy audits,

Integrated Solutions for a Sustainable Flagstaff

use of diagnostic equipment and installation of structural energy and water conservation measures. Participants will serve six month terms during which they will receive building science certifications and AmeriCorps Education Awards for use in the pursuit of post-secondary education. Graduating participants will add qualified professionals to the local green collar workforce, helping to alleviate the growing need for trained professionals in energy efficiency and renewable energy sectors.

Service Tiers

Proposed programming will include two progressive and impactful tiers of building energy conservation retrofits implemented through partnerships between building science professionals, contractors, suppliers and the Energy Conservation Corps.

Tier I – Initial Building Efficiency and Conservation

First tier services include the installation of low cost, high efficiency energy and water conservation measures and community education and outreach performed by trained and certified Energy Conservation Corps crews. 225 residential buildings will be served. Services include:

- Carbon monoxide detector installation (2)
- Compact fluorescent light bulb installation (20)
- High efficiency water fixture installation (5 faucets, 2 showerheads and 2 toilet tank banks)
- Insulation of first five feet of hot water lines
- HVAC filter replacement
- Structural air leak mitigation (weather stripping, outlet gaskets, caulking, plumbing penetration)
- Distribution of energy and water conservation educational and outreach information
- Structural savings and consumption tracking and certification

Tier II – Advanced Structural Efficiency & Conservation

Second tier services include the implementation of all first tier measures as well as mitigation of more advanced needs identified through the performance of energy audits. Implementation, community education and outreach will be performed jointly by trained and certified Energy Conservation Corps crews and building science professionals. 325 residential buildings will be served. Measures include as necessary:

- Carbon monoxide detector installation (2)
- Compact fluorescent light bulb installation (20)
- High efficiency water fixture installation (5 faucets, 2 showerheads and 2 toilet tank banks)
- Insulation of first five feet of hot water lines
- HVAC filter replacements
- Structural energy auditing including blower door testing (pre and post treatment)
- Advanced structural air leak mitigation
- Building envelope mitigation and duct seal mitigation
- Carbon monoxide safety testing
- Furnace inspection
- Hot water heater insulation blanket installation (as appropriate)
- Distribution of energy and water conservation educational and outreach information

Integrated Solutions for a Sustainable Flagstaff

- Retrofit guidance and recommendation
- Structural savings and consumption tracking and certification

Income Based Fee Schedule

Services will be available to Flagstaff residents according to an income based fee structure whereby American Reinvestment and Recovery Act (ARRA) funding will be leveraged against participant's contributions to subsidize the expense of implementing energy efficiency retrofits. The fee structure will generate income which shall be committed to the proposed programming and used to further program objectives. The fees are in compliance with Code of Federal Regulations, Title 10, Volume 4 Section 600.124 program income.

Leveraged Funds

Leveraged funds will maintain a revolving fund to help support the program beyond ARRA. An estimated \$94,375 in fees will be collected through the service tier fees. This combined with \$40,000 of formula funds, will help to sustain ISSF.

Fee Schedule	Household Income	Cost	Service Packages Available	Contribution to Revolving Fund
Tier I Services				
	\$0.00 - 40,000	\$0.00	100	
	\$40,001 - 70,000	\$50.00	75	\$3,750.00
	\$70,001 +	\$75.00	50	\$3,750.00
Sub-total			225	\$7,500.00
Tier II Services				
	\$0.00 - 49,999	\$25.00	100	\$2,500.00
	\$50,000 - 64,999	\$125.00	75	\$9,375
	\$65,000 - 79,999	\$375.00	75	\$28,125.00
	\$80,000 +	\$625.00	75	\$46,875.00
Sub-total			325	\$86,875.00
Total leveraged \$				\$94,375.00

Integrated Solutions for a Sustainable Flagstaff

Budget

Materials and Principal Provider				
	Provider/Contractor	Cost per Structure	# of Structures	Totals
Tier I Services	Energy Conservation Corps (ECC)	\$ 125	225	\$ 28,125
Tier II Services	Building Science	\$ 1,250	325	\$ 406,250
<i>Subtotal</i>				\$ 434,375
SubGrantee Labor				
	Provider/Contractor	Fee	Years	Totals
Tier I Services	Energy Conservation Corps	\$ 12,000	2	\$ 24,000
<i>Subtotal</i>				\$ 24,000
Workforce Development Services				
	Position	Salary	Year	Totals
Staffing				
	Sustainability Specialist	\$ 3,394	2	\$ 6,788
	COF Program Coordinator	\$ 16,376	2	\$ 32,752
	Americorp Member	\$ 2,400	1	\$ 2,400
	COF Indirect Fee	\$ 35,574		\$ 35,574
<i>Subtotal</i>				\$ 77,514
Tools and Equipment				
	Description	Cost per Unit		Totals
COF				
	Equipment	\$ 961		\$ 961
<i>Subtotal</i>				\$ 961
Training				
	Description	Cost per Unit		Totals
Building Science				
	ECC	\$ 1,000		\$ 1,000
<i>Subtotal</i>				\$ 1,000
Outcome Tracking				
	Description	Cost per Unit		Totals
Outcome Tracking				
	Performance Tracking	\$ 8,000		\$ 8,000
	Quality Control	\$ 50	25	\$ 1,250
<i>Subtotal</i>				\$ 9,250
Program Subtotals				\$ 547,100
Leveraged Funds				
	Leveraged funds			\$ 40,000
Program total				\$ 587,100

IMPLEMENTATION

Proposed programming can be expeditiously implemented. Organizational and community capacity exists whereby program employees can be hired and trained within 90 days of funding availability. Tier I and II services can begin delivery within 90 days of funding availability with full program implementation anticipated within 120 days.

ISSF Phases
1. Issue request for proposals in accordance with Federal/City procurement guidelines for building science energy efficiency specialists. Issue request for proposals in accordance with Federal/City procurement guidelines for performance tracking. Conduct analysis of residential housing stock. Report as required.
2. Finalize energy efficiency program procedural materials and process. Report as required.
3. Recruit and train Energy Conservation Corps members. Report as required.
4. Initiate public outreach efforts to promote the energy efficiency program. Report as required.
5. Begin full program implementation within 120 days of funding. Implement continuous monitoring, verification, quality assurance and transparency. Report as required.
6. Complete EECBG implementation within 36 months.

COMMUNITY IMPACT - DELIVERABLES

Proposed programming will have significant and sustained impacts within Flagstaff. Community outcomes will be realized in the areas of energy saved, greenhouse gas emissions reduced, jobs retained and created and utility costs saved.

Energy Saved

Energy savings will vary depending on the Service Tier implemented within each structure and the condition of the existing structure. Estimates are provided herein according to approximate savings per structure and Tier. All estimates are based on a U.S. average consumption of 100mm Btu per structure annually. Tier 1 is estimated to increase the efficiency of a building up to 15%. Tier 2 is estimated to increase the efficiency of a building up to 30%.

Greenhouse Gas Emissions Reduced

Reductions in greenhouse gas emissions will vary depending on the Service Tier implemented within each building. Estimates are provided herein according to approximate

Integrated Solutions for a Sustainable Flagstaff

reductions per building and Tier. All estimates in the table below are based on the EPA's U.S. average production of 41,500 pounds of carbon dioxide equivalents per a household of two annually.

Utility Cost Savings

Savings on utility bills will vary depending on the Service Tier implemented within each building. Estimates are provided herein according to approximate reductions per building and Tier. All estimates in the table below are based on a U.S. average expenditure of \$1,500 per building annually for electricity.

	Structures Treated	Energy Saved (Btu/yr)	Energy Saved (kWh/yr)	Water Saved (gal/yr)	Greenhouse Gas Emissions Reduced (lbs. CO2/yr)	Utility Cost Savings (\$/yr)
Tier I	per unit	15,000,000	1,335	2,000	6,225	\$225
Tier II	per unit	30,000,000	2,670	2,000	12,450	\$450
	Structures Treated	Energy Saved (Btu/yr)	Energy Saved (kWh/yr)	Water Saved (gal/yr)	Greenhouse Gas Emissions Reduced (lbs. CO2/yr)	Utility Cost Savings (\$/yr)
Tier I	225	3,375,000,000	300,750	450,000	1,400,625	\$50,6250
Tier II	325	9,750,000,000	867,750	650,00	4,046,250	\$146,250

Jobs Created and Retained

Proposed programming will have significant direct and indirect job creation and retention outcomes, in both public and private sectors. In addition, the workforce development component through the Energy Conservation Corps will create annual apprenticeship opportunities for underemployed and displaced workers, providing them with training and on-the-job work experience leading to post-Corps career placements. Further, these placements will serve to supplement the workforces of growing green collar industries as well as create new energy and resource conservation businesses throughout the region.

Reporting

Accurate assessment is essential to an effective and long term Integrated Solutions for a Sustainable Flagstaff because it establishes a solid benchmark for progress, enables cost analysis and allows the effect of energy efficiency installations to be isolated and quantified apart from other factors (e.g., weather) that may affect energy use. Utilizing a web-based tracking mechanism ISSF will perform statistical analysis of the utility consumption data for all program participants. This analysis will include electricity usage (kWh), gas usage (therms), and their equivalent in greenhouse gas emissions, as well as water usage (gallons), and dollar cost for these utility resources.

ISSF will conduct before and after tracking of monthly and accumulated use to document energy, greenhouse gas, and water savings resulting from home energy efficiency retrofits. Data aggregation and analyses to provide information on average data use, the distribution

Integrated Solutions for a Sustainable Flagstaff

of use, total use and program savings for all three utilities will be reported. ISSF's approach conforms to the International Performance Measurement and Verification Protocol (IPMVP) Option C for verifying results of energy efficiency measures.

The City of Flagstaff will adhere to reporting requirements as stated in the U.S. Department of Energy Federal Assistance Reporting Checklist and Instructions.

Transparency

ISSF will ensure oversight, transparency and accountability for all program activities. The City of Flagstaff has established a community web page listing all ARRA fund activities. ISSF will also generate a web page with current and accurate data for community tracking. This data will include the numbers of structures retrofitted, energy saved (Btu/therms), greenhouse gas emissions saved, utility cost savings and ARRA funds spent to date.

COMMUNITY PARTNERS – SUSTAINABILITY

Proposed programming incorporates a wide variety of community partners from public, private and non-profit sectors. These partnerships will provide the city of Flagstaff residents with an increase in energy independence, economic vitality and social inclusion. The following partners are currently working towards a sustainable community through varying arenas and areas of experience and expertise:

City of Flagstaff Sustainability Program: Established in 2007 the program promotes sustainable living and provides practical solutions through program and policy development to the Flagstaff community.

Coconino Rural Environment Corps (CREC): In operation for 10 years and a program of Coconino County Community Services Department, CREC has been recognized and received national awards for the corps program it provides to the community.

Coconino County Housing Rehabilitation Program: Working with the community for over ten years by providing grants and non-interest loans to low-income county residents to maintain safe, healthy and efficient homes.

Coconino County Sustainable Building Program: Launched in 2003, the program serves as a central resource on sustainable building development for the citizens of Coconino County and the City of Flagstaff; the program encourages and supports sustainable building practices through policy and education.

ISSF will collaborate with local nonprofits and neighborhood associations to design and facilitate a community education and participation plan. Through neighborhood meetings and community workshops Flagstaff residents will learn about their energy consumption, pro-active strategies to reduce their consumption as well as how to apply for the ISSF program.